

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

SYNQOR, INC.,

§

v.

No. 2:11CV54

**CISCO SYSTEMS, INC. AND VICOR
CORPORATION**

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MEMORANDUM OPINION AND ORDER

The above-referenced case was referred to the undersigned United States Magistrate Judge for pre-trial purposes in accordance with 28 U.S.C. § 636. Before the Court are Plaintiff's Opening Claim Construction Brief (Docket Entry #277), Defendants' Response (Docket Entry # 280), Plaintiff's Reply (Docket Entry #285). Also before the Court are the Local Patent Rule ("P.R.") 4-3 Joint Claim Construction and Prehearing Statement (Docket Entry #267) and the Joint Claim Construction Chart (Docket Entry #290).

A claim construction hearing, in accordance with *Markman v. Westview Instruments*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996), was held in Texarkana on December 17, 2013. After hearing the arguments of counsel and reviewing the relevant pleadings, presentation materials, other papers, and case law, the Court finds the disputed terms of the patents-in-suit should be construed as set forth herein.

I. BACKGROUND

Plaintiff filed suit on January 28, 2011, alleging infringement of six patents-in-suit: U.S. Pat. Nos. 7,072,190 ("190 Patent"), 7,269,034 ("034 Patent"), 7,272,021 ("021 Patent"), 7,558,083 ("083 Patent"), 7,564,702 ("702 Patent") and 8,023,290 ("290 Patent"). All of the

patents contain disputed claim terms except for the ‘034 Patent for which there are no disputed claim terms.

The patents are all related. All of the patents except for the ‘021 Patent have a continuation and divisional chain to a common parent application. These continuation/divisional patents have similar, though not identical, specifications and reference is generally made herein to the ‘190 Patent. The ‘021 Patent is a continuation-in-part patent having a differing specification that claims priority at least in part through a variety of applications to the common parent application.

The ‘190 Patent, ‘034 Patent, ‘021 Patent, ‘083 Patent and ‘702 Patent were the subject of a prior suit brought by SynQor against a different set of defendants, *SynQor, Inc. v. Artesyn Techs., Inc., et al.*, Case No. 2:07-cv-497-TJW-CE (“‘497 case”). In the ‘497 case, a claim construction order was issued on July 26, 2010. ‘497 case, Docket Entry # 474 (“‘497 Order”). The Federal Circuit affirmed the trial court findings that the patents were valid and infringed. *SynQor, Inc. v. Artesyn Techs., Inc., et al.*, 709 F.3d 1365 (Fed. Cir. 2013). A number of reexamination proceedings have taken place for the patents-in-suit subsequent to the ‘497 Order.

The parties present five claim terms for construction. None of the disputes currently raised by the parties were explicitly addressed by the Federal Circuit. One term in dispute raises basically the same issues as addressed in the ‘497 Order for that term (“means for controlling duty cycle”). Three other terms were addressed in whole or in part in the ‘497 Order, but the issues raised by the current Defendants were not raised or addressed in the ‘497 Order. Three of the terms in dispute were not addressed in the ‘497 Order at all (“fixed duty cycle,” “substantially uninterrupted flow of power,” and power flow “first before” any regulation stage).

As in the ‘497 case, the patents-in-suit are directed to power converters that have, typically, a regulation stage without isolation and a separate isolation stage that has no regulation. In general, an isolation stage has no electrical connection between its input and output, and a regulation stage allows a circuit to control its output voltage. The claims of the ‘190, ‘083, ‘702, and ‘290 patents are directed to “regulation” of the output voltage, while the ‘034 patent introduces the concept of “semiregulation.”¹ The continuation-in-part ‘021 Patent introduces the concept of multiple “modes” of operation, including a “normal” mode of operation and an “other than normal” mode of operation. Each claim in the ‘021 Patent recites that certain actions only occur “during normal operation.”

The abstract of the ‘190 Patent provides as follows:²

A power converter nearly losslessly delivers energy and recovers energy from capacitors associated with controlled rectifiers in a secondary winding circuit, each controlled rectifier having a parallel uncontrolled rectifier. First and second primary switches in series with first and second primary windings, respectively, are turned on for a fixed duty cycle, each for approximately one half of the switching cycle. Switched transition times are short relative to the on-state and off-state times of the controlled rectifiers. The control inputs to the controlled rectifiers are cross-coupled from opposite secondary transformer windings.

Claim 1 of the ‘190 Patent is reproduced below:

A power converter system comprising:

a DC power source;

a non-regulating isolation stage comprising:

 a primary transformer winding circuit having at least one primary winding connected to the source; and

¹ SynQor added “the output can be said to be semi-regulated” language in the specification of the ‘034 Patent during prosecution and argued it was already materially disclosed in the rest of the specification. Figure 11 of the ‘034 Patent is also new as compared to the original application.

² The abstracts for the ‘034, ‘083, ‘702 and the ‘290 Patents are identical to the abstract of the ‘190 Patent.

and a secondary transformer winding circuit having at least one secondary winding coupled to the at least one primary winding and having plural controlled rectifiers, each having a parallel uncontrolled rectifier and each connected to a secondary winding, each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding to provide an output, each primary winding having a voltage waveform with a fixed duty cycle and transition times which are short relative to the on-state and off-state times of the controlled rectifiers; and

a plurality of non-isolating regulation stages, each receiving the output of the isolation stage and regulating a regulation stage output while the fixed duty cycle of the isolation stage is maintained.

The abstract of the '021 Patent states:

In a power converter, the duty cycle of a primary winding circuit causes near continuous flow of power through the primary and secondary winding circuits during normal operation. By providing no regulation during normal operation, a very efficient circuit is obtained with a synchronous rectifier in the secondary operating at all times. However, during certain conditions such as start up or a short-circuit, the duty cycle of the primary may be reduced to cause freewheeling periods. A normally non-regulating isolation stage may be followed by plural non-isolating regulation stages. To simplify the gate drive, the synchronous rectifiers may be allowed to turn off for a portion of the cycle when the duty cycle is reduced. A filter inductance of the secondary winding circuit is sufficient to minimize ripple during normal operation, but allows large ripple when the duty cycle is reduced. By accepting large ripple during other than normal operation, a smaller filter inductance can be used.

Claim 1 of the '021 Patent is reproduced below:

A power converter system comprising:

a normally non-regulating isolation stage comprising:

a primary winding circuit;

a secondary winding circuit coupled to the primary winding circuit, the secondary winding circuit comprising a secondary transformer winding in series with a controlled rectifier having a parallel uncontrolled rectifier, the secondary winding circuit providing a normally non-regulated output of the isolation stage; and

a control circuit which controls duty cycle of the primary winding circuit, the duty cycle causing substantially uninterrupted flow of power through the primary and secondary winding circuits during normal operation; and

a plurality of non-isolating regulation stages, each receiving the non-regulated output of the isolation stage and regulating a regulation stage output.

II. LEGAL PRINCIPLES

The claims of a patent define the invention to which the patentee is entitled the right to exclude. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). Claim terms are given their ordinary and customary meaning to one of ordinary skill in the art at the time of the invention, unless there is clear evidence in the patent's specification or prosecution history that the patentee intended a different meaning. *Phillips*, 415 F.3d at 1312-13. Claim construction is informed by the intrinsic evidence: the patents' specification and file histories. *Id.* at 1315-17. Courts may also consider evidence such as dictionary definitions and treatises to aid in determining the ordinary and customary meaning of claim terms. *Phillips*, 415 F.3d at 1322. Further, “[o]ther claims, asserted and unasserted, can provide additional instruction because ‘terms are normally used consistently throughout the patent.’” *SmartPhone Techs. LLC v. Research in Motion Corp.*, No. 6:10-CV-74-LED-JDL, 2012 WL 489112, at *2 (E.D. Tex. Feb. 13, 2012) (citing *Phillips*, 415 F.3d at 1314). “Differences among claims, such as additional limitations in dependent claims, can provide further guidance.” *Id.*

A court should “avoid the danger of reading limitations from the specification into the claim.” *Phillips*, 415 F.3d at 1323. For example, “although the specification often describes very specific embodiments of the invention, [the Federal Circuit has] repeatedly warned against confining the claims to those embodiments.” *Id.* The Federal Circuit has “expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment.” *Id.* This is not only because of the requirements of Section 112 of the Patent Act, but also because “persons of ordinary skill in the

art rarely would confine their definitions of terms to the exact representations depicted in the embodiments.” *Id.* Limitations from the specification should only be read into the claims if the patentee “acted as his own lexicographer and imbued the claim terms with a particular meaning or disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction.” *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003) (citations omitted); *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1367 (Fed. Cir. 2012).

Similarly, the prosecution history may not be used to infer the intentional narrowing of a claim absent the applicant’s clear disavowal of claim coverage. *Superguide Corp. v. DirecTV Enters.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (citations omitted). “To be given effect, such a disclaimer must be made with reasonable clarity and deliberateness.” *Id.*

Guided by these principles of claim construction, this Court directs its attention to the patents-in-suit and the disputed claim terms.

III. CLAIM CONSTRUCTION

At the hearing, the parties agreed as to the construction of the following term: “**each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding**” means “**each controlled rectifier being turned from on to off and from off to on at some point in the course of the change of the voltage waveform across a primary winding.**”

The parties have submitted the following five disputed terms for construction.

A. “Fixed duty cycle”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“a duty cycle that does not substantially vary.” Alternative proposed in Reply Brief: “the duty cycle of the power switches is not varied to control the output voltage towards a predefined value.”	“a duty cycle that remains unchanged regardless of input voltage or load” Alternative proposed in Response Brief: “a duty cycle that changes only negligibly in response to changes of input voltage or load.”

This disputed term appears in ‘190 Patent claim 1, ‘083 Patent claims 1 and 39, and ‘702 Patent claims 1, 28, 55, 78, 82 and 86. This term was not addressed in the ‘497 Order.

(1) Parties’ Positions

SynQor asserts the key dispute is whether a “fixed” duty cycle means the duty cycle “does not substantially vary” as proposed by SynQor as opposed to “remains unchanged regardless of input voltage or load” as proposed by Defendants. (Docket Entry # 277 at 12). SynQor further asserts a person of ordinary skill in the art would understand that in real-world power converters a duty cycle that has been set at a particular level will necessarily have small variations due to a variety of factors: temperature, input voltage, and output current. SynQor cites to its expert report for this understanding of one skilled in the art. (*Id.* at 12-13). SynQor’s expert asserts no real world DC-DC converter would literally meet Defendants’ claim limitations. (*Id.* at 13). According to SynQor, Defendants’ construction would thus exclude the preferred embodiments of the patents which are real world converters. (*Id.*). SynQor further asserts even Defendants’ expert acknowledged that the actual duty cycle would have variations as the temperature, current and, voltage vary over the converters operating range. (*Id.* at 14).

In their response, Defendants assert the plain meaning of “fixed” means “fixed” not “substantially fixed.” Defendants assert that elsewhere in the claims “substantially” and “nearly” are used for other terms, but they are never used to modify “fixed duty cycle.” According to Defendants, “insubstantial” variations are not described in the specification, and SynQor has provided no intrinsic evidence to support its position. (Docket Entry #280 at 19). Defendants contend that adding “substantially” before “fixed” renders the claims indefinite because SynQor is adding a word of degree with no description of the degree supported in the specification. (*Id.* at 20) (citing *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008)). Defendants further assert that when asked SynQor’s expert could not opine on whether 0.001% is substantial or not, demonstrating how a jury would not have guidance as to the meaning of “substantial.” Defendants claim there is thus no way for one skilled in the art to determine the boundaries of the claim. (*Id.* at 20).

According to Defendants, their construction conforms with the specification and with SynQor’s expert in that a “fixed duty cycle” is not varied to control the output voltage towards a set point. (*Id.* at 20-21). Defendants cite ‘190 Patent at 2:14-18 as the only section of the specification that discusses “fixed duty cycle” and assert this section directly contrasts fixed duty cycles with converters that regulate the output voltage. (*Id.* at 21). Defendants assert each claim that uses “fixed duty cycle” does so in the context of a non-regulating isolation stage. (*Id.*) (citing ‘190 Patent claim 1; ‘083 Patent claims 1, 39; ‘702 Patent claims 1, 28, 55). Defendants assert SynQor’s construction omits the concept on a non-regulating stage and leaves the jury to wonder what is “substantial.” According to Defendants, absent guidance from the specification as to “substantial,” it is contrary to Federal Circuit law to leave the question to the jury.

Defendants further object to SynQor's expert as being unreliable. First, Defendants assert that SynQor's expert relied on SynQor's construction in forming his opinion, thus providing a circular opinion. Further, Defendants object that every document SynQor's expert relied upon was dated seven to sixteen years after the patent priority date in question. (Docket Entry #280 at 22). Defendants assert their expert testified that "substantially" is a relative term that would itself require construction. Defendants further assert their expert noted that to the extent a fixed duty cycle varies, such variations are negligible and can be quantified using percentages if necessary. (*Id.*).

Defendants object to SynQor's characterization of Defendants' construction as requiring "completely" unchanged. Defendants assert that "completely" is not included in its construction. Defendants assert that a "real-world converter will of course have a non-zero – but negligible – degree of variation in duty cycle." (*Id.* at 23). Defendants assert such a duty cycle is still "fixed," "set," and "unchanged." (*Id.* at 23-24). Defendants state their expert testified that 20% variance in a duty cycle would be non-negligible but that SynQor cannot put any bounds on the term. (*Id.* at 24). Defendants propose an alternative construction of "a duty cycle that changes only negligibly in response to changes of input voltage or load." (*Id.* at 24, n. 17).

In its reply, SynQor notes Defendants admit that a real world converter "will of course" have some variation and that SynQor is misreading Defendants' construction. SynQor objects however that a jury may well adopt such a view of Defendants' term "unchanged." (Docket Entry #285 at 3). SynQor objects to Defendants' new proposal of "negligible," asserting Defendants point to no intrinsic evidence that real world variations are only negligible. (*Id.*). SynQor asserts it would agree to the following construction: "the duty cycle of the power switches is not varied to control the output voltage towards a predefined value." (*Id.* at 3, n. 1).

(2) Court's Construction

SynQor has provided no intrinsic evidence to support its position regarding use of the word “substantial.” When a “‘word of degree’ is used, the court must determine whether the patent provides ‘some standard for measuring that degree.’” *Biosig Instruments, Inc. v. Nautilus, Inc.*, 715 F.3d 891, 898 (Fed. Cir. 2013) (citation omitted). SynQor has not provided any specification citations to indicate the specification provides any guidance as to a measure of this word of degree. Conversely, Defendants’ construction of “unchanged” is also problematic. Defendants have acknowledged that no real world systems would be “unchanged.” Defendants’ alternative proposal of “negligible” suffers from the same problems as “substantial.”

In the context of the specifications, “fixed duty cycle” is described in the context of a converter that does not control or regulate its output voltage. Thus, an isolator circuit having a fixed duty cycle further requires coupling to a regulation stage to regulate “the output while the fixed duty cycle is maintained.” (‘190 Patent at 2:14-18, claim 1.) In the regulator stage, “[r]egulation is by control of the duty cycle.” (‘190 Patent at 4:54-55). Thus, regulation is achieved by control of the duty cycle, and a fixed duty cycle is a duty cycle that is not controlled. “Fixed duty cycle” in this context conforms with SynQor’s alternative proposed construction. In addition, this context conforms with Defendants’ statement describing a “fixed duty cycle:” “the duty cycle is ‘fixed’ so that it does not regulate the output voltage in response to changes in input voltage or load.” Defendants further stated “[a]s SynQor’s expert Dr. Leeb correctly explained in the ‘497 case, ‘[a] fixed duty cycle means that the duty cycle of the power switches is not varied to control the output voltage towards a set point / predefined values.’” (Docket Entry #280 at 20-21). Defendants further stated that “the purpose of having a ‘fixed duty cycle’ is to

avoid including circuitry that adjusts the duty cycle in response to variations in input voltage and load.” (*Id.* at 21).

At the claim construction hearing, Defendants acknowledged such an interpretation by showing the structure of a variable duty cycle having feedback control circuitry adjusting the power converter based on the output voltage while showing the structure of a fixed duty cycle converter lacking such feedback control circuitry. (Defendants Hearing Slide 61). Further, Defendants acknowledged that the construction adopted by the Court below which focuses on this control context is an accurate and true statement of fact regarding fixed duty cycles. Defendants assert such a construction does not resolve the parties’ dispute as to how much “real world” variation is permissible. However, the Court’s construction does resolve such dispute as the Court’s construction rejects such a context for defining “fixed duty cycle.” Rather, the Court’s context conforms to the specification which describes a “fixed duty cycle” in the context of a duty cycle that is set to a value and not controlled based upon the detected output voltage.

The Court therefore construes “**fixed duty cycle**” to mean “**a duty cycle that is not varied to control the output voltage towards a predefined value.**”

B. “Transition times which are short relative to the on-state and off-state times of the controlled rectifier”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
<p>“transition times” means: “time periods during which a change of a voltage waveform occurs across a primary winding.”</p> <p>“transition times which are short relative to the on-state and off-state times of the controlled rectifiers” means: “transition times which are less than 20% of the overall on-state and off-state times of the controlled rectifiers”</p>	<p>“transition times” means: “time periods during which a voltage waveform across a primary winding undergoes an oscillation.”</p> <p>“transition times which are short relative to the on-state and off-state times of the controlled rectifiers” means: “the sum of all transition times totals less than 20% of the total switching cycle. Full resonant, quasi-resonant and multi-resonant converters do not have short transitions”</p>

This disputed term appears in claims 1, 28, and 31 of the ‘190 Patent and claims 1, 28, 55, 78, 82, and 86 of the ‘702 Patent. In the ‘497 Order, Judge Ward construed this term as proposed by SynQor. However, it does not appear the ‘497 Order addressed the specific issues raised herein.

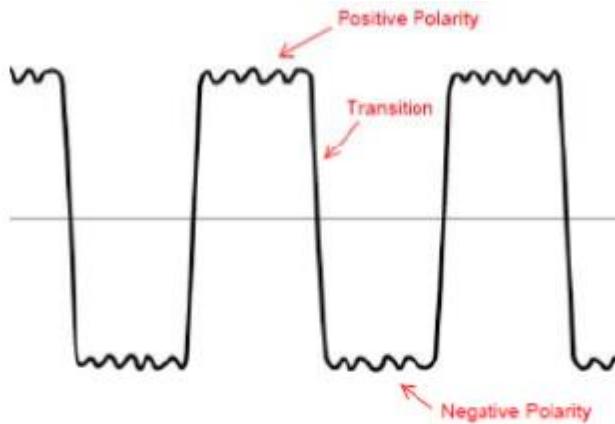
(1) Parties’ Positions

According to the parties’ briefing, the three issues before the Court are as follows: (1) whether the construction should explicitly recite “sum of all transition times;” (2) whether transitions are limited to “oscillations;” and (3) whether “full resonant, quasi-resonant and multi-resonant converters” should be excluded from short transitions. In its brief, SynQor agreed this term literally means “the sum of all transition times totals less than 20% of the total switching cycle,” but it asserted it does not believe it is necessary to disturb the ‘497 Order’s construction. (Docket Entry #277 at 15, n.8). However, SynQor did not address this dispute in its reply or at

the hearing. Thus, the Court agrees with Defendants' proposal as to "the sum of all transaction times."

"oscillations"

Regarding the second issue, SynQor asserts the '497 Order's construction should be maintained. SynQor objects to Defendants' addition of "oscillations" and asserts that "transition" and "oscillation" have different meanings. According to SynQor, to one skilled in the art "a 'transition' refers to a change in voltage from one level to another level, i.e., from a plateau corresponding to one polarity of the signal to a plateau corresponding to the other polarity." (Docket Entry #277 at 15). SynQor asserts a signal may oscillate even when it has not transitioned. SynQor demonstrates this with a figure on page 16 of its brief:



SynQor asserts Defendants' expert acknowledged that such fluctuations at a plateau would not be considered transitions. (*Id.* at 16). SynQor further asserts that real world systems would have some fluctuations and such fluctuations would occur in the time periods of the plateaus and thus would not be "short." SynQor asserts Defendants' proposed construction would thus not read on the preferred embodiments. (*Id.* at 17).

In response, Defendants assert the specification explains "the circuit topology permits the synchronous rectifier switch transitions to proceed as oscillations between inductors and

capacitors.” (‘190 Patent at 8:8-11). Defendants assert the specification does not teach transitions that are not oscillations. (Docket Entry #280 at 9). Defendants point to the capacitances C3 and C4 and inductances Lp1 and Lp2 as the elements of Figure 5 in which oscillations occur:

during this part of the transition, the voltages across both transformers’ secondary windings will be approximately the output voltage minus half the voltage across C3. As the oscillation ensues, therefore, the transformer winding voltages, which started at zero, build up toward the output voltage.

(‘190 Patent at 8:54-59). Defendants assert the oscillations of the voltages of the transformer windings and the oscillations between the capacitors and inductors are thus interrelated. (Docket Entry #289 at 10).

Defendants contend SynQor conflates the concept of oscillations with mere “fluctuations” and asserts that “fluctuations” would encompass the random imperfections of a real world voltage waveform. Defendants assert that, just the opposite, it is SynQor’s construction that would encompass the imperfections of real world systems in that SynQor’s construction of “transition” is any “change” whatsoever, including the random fluctuations SynQor points to. (Docket Entry #280 at 10-11). Defendants assert SynQor’s expert agreed that “fluctuations” is more general than “oscillations.” (*Id.* at 11). Defendants further assert “oscillations” would not include the random changes (noise) SynQor’s briefing focuses on as oscillations are systematic changes that are designed to make a system work. (*Id.*).

In reply, SynQor argues the ordinary meaning of “transition” is change, and not all transitions are oscillations. SynQor asserts Defendants have not pointed to anything in the specification mandating that transitions in the primary winding be oscillations. (Docket Entry #285 at 4). According to SynQor, the passages relied upon by Defendants regarding the circuit elements relate to the switching of the controlled rectifiers, not the voltage on the primary

winding. Moreover, SynQor contends the passage in question merely describes a specific preferred embodiment. (*Id.*).

“full resonant, quasi-resonant and multi-resonant converters”

Regarding the third issue, SynQor argues Defendants seek to add the “full resonant, quasi-resonant and multi-resonant converters” limitation based on the following passage of the ‘190 Patent:

These transitions are short compared to the overall on-state and off-state portions of the switching cycle (e.g. less than 20% of the time is taken up by the transition). This characteristic of nearly lossless and relatively short transitions, which we will call soft switching, is distinct from that used in full resonant, quasi-resonant, or multi-resonant converters **where the oscillations last for a large portion, if not all, of the on-state and/or off-state time.**

(‘190 Patent at 8:11-19) (emphasis added). SynQor asserts the specification distinguishes long transitions from short transitions; long transitions can be, but are not always, found in full resonant, quasi-resonant and multi-resonant converters. (Docket Entry #277 at 17). SynQor asserts such converters themselves were not distinguished; only those converters “where the oscillations last for a large portion” of the time were distinguished. (*Id.* at 17-18). SynQor cites to its expert’s declaration, contending one in the art would understand that not all of such converters would necessarily have transitions for a large portion of the waveform. (*Id.* at 18). SynQor asserts the Judge Ward rejected SynQor’s request to add such a limitation because the sentence at issue “does not state that it is a necessary requirement for the definition of the disputed phrase.” (*Id.* at 18) (quoting ‘497 Order at 32).

According to SynQor, the ‘190 Patent reexamination confirms the limitation should not be read into the claims. SynQor notes the Patent Trial and Appeal Board (“PTAB”) adopted the ‘497 Order construction and did not add the extra limitations sought by Defendants. (Docket

Entry #277 at 18 (citing Ex. 6, PTAB Order at 13). SynQor further notes the PTAB did not dismiss the Steigerwald reference merely because the converter was a resonant converter but rather because the transition times did not satisfy the 20% limitation. (*Id.* at 18-19).

In response, Defendants assert SynQor admitted in the '497 case that the passage in the '190 Patent at 8:16-19 was a disavowal of resonant converts. (Docket Entry #280 at 6). Defendants further assert SynQor repeatedly made such assertions in the file history, including statements made in reexamination after the claim construction ruling in the '497 case. Defendants cite to the following '190 Patent reexamination statement made by SynQor:

Steigerwald '539 does not teach that 'less than 20% of the time is taken up by transition.' Rather, Steigerwald '539 clearly teaches a resonant converter (as admitted by the Request, p. 148), and therefore was expressly excluded from the definition, which is distinct from that used in full resonant, quasi-resonant, or multi-resonant converters where the oscillations last for a large portion, if not all, of the on-state and/or off state time. . . .

In the end, both JP '446 and Steigerwald '539 have 'long' transitions, as shown by the very waveforms in these documents, because they are specifically resonant topologies.

(Docket Entry #280 at 7) (quoting Ex. 5, SynQor Response to Office Action ('190 Patent Reexamination) at 67-68). Defendants also cite to the '702 Patent reexamination statement made by SynQor:

[r]esonant sinusoidal waveforms do not have the short transitions required to drive controlled rectifiers. Rather, slow waveform transitions (inherent in a sinusoidal waveform) make it difficult for controlled rectifiers to be driven reliably. . . .

Steigerwald's capacitance-multiplier converter is a resonant forward converter, and the voltage across a primary winding of the converter is sinusoidal in shape...[a]s such, the voltage waveform does NOT have short transitions compared to the length of the half-cycle....

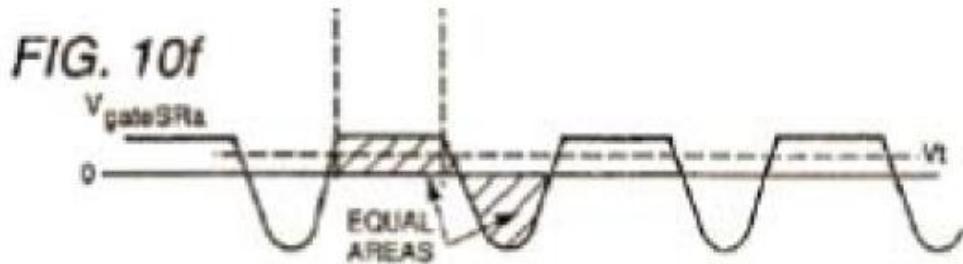
(Docket Entry #280 at 7) (quoting Ex. 6, SynQor Response to Office Action ('702 Patent Reexamination) at 52-53). According to Defendants, such repeated disparagement confirms the disavowal of resonant converters. (*Id.* at 7).

Defendants note the '497 case did not involve resonant converters, so it was unnecessary for the Court in the '497 Case to add the limitation in question. Further, Defendants assert the reexamination statements noted above were made after the claim construction hearing in the '497 case. (*Id.* at 8). As to the PTAB, Defendants note the PTO uses a different standard for construction than courts, affording "the broadest reasonable interpretation in light of the specification." (*Id.* at 8) (citing *In re Am. Acad. Of Sci. Tech Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004)). Defendants further note the reexamination Requester did not present arguments to the PTAB on this issue as acknowledged by SynQor. (*Id.* at 8-9).

In its reply, SynQor reiterates the PTAB adopted the same construction as the '497 Order. SynQor asserts it did not disavow the resonant converters in the reexamination. (Docket Entry #285 at 5). SynQor further asserts the passages cited by Defendants do not qualify as a "clear and unmistakable" disclaimer of all possible types of resonant converters. (*Id.*). SynQor notes that in the '190 Patent Reexamination, it explicitly stated that the patent "excludes waveforms used by certain 'resonant converters,' 'where the oscillations last for a large portion, if not all, of the on-state and/or off state time' (e.g. JP '446 Steigerwald '090 and Steigerwald '539)." (*Id.*) (quoting Docket Entry #280 Ex. 5, SynQor Response to Office Action ('190 Patent Reexamination) at 4). SynQor asserts it did not distinguish all resonant converters but only certain ones in which the oscillations "last for a large portion, if not all" of the on and off state time. (*Id.* at 5-6). In addition, SynQor notes that the '190 Patent reexamination response was made on July 13, 2010, before the claim construction ruling was made in the '497 case. To the

extent the prosecution history creates any ambiguity, SynQor asserts the PTO resolved such ambiguity by concluding there was no exclusion. (*Id.* at 6).

SynQor cites to a figure of Steigerwald which demonstrates the Steigerwald transition times are much longer than the required less than 20%:



(Docket Entry #285 at 6). SynQor asserts the point of distinction of Steigerwald was the 20% limitation. (*Id.* at 5-6).

(2) Court's Construction

"oscillations"

The specification treats transitions as different from oscillations: “the circuit topology permits the synchronous rectifier switch transitions to proceed as oscillations between inductors and capacitors.” (‘190 Patent at 8:8-11). Thus, as used in this passage oscillations are a type of transition, and transitions are not inherently oscillations. *See Phillips*, 415 F.3d at 1314 (“[T]he claim term in this case refers to ‘steel baffles,’ which strongly implies that the term ‘baffles’ does not inherently mean objects made of steel.”). Further, Defendants do not contest that the ordinary meaning of “transitions” is broader than “oscillations.” Rather, Defendants point to the specification embodiments to support their position. However, even if only a single embodiment exists, the preferred embodiment is not inherently required to be read into the claims. *See Arlington Industries, Inc. v. Bridgeport Fittings, Inc.*, 632 F.3d 1246, 1254 (Fed. Cir. 2011)

(“Even where a patent describes only a single embodiment, claims will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.”) (internal citations omitted). Defendants have not pointed to a clear intention to limit the claim scope or an expression of manifest restriction to limit “transitions” to “oscillations.”

The parties appear to agree that “transitions” are the changes from a plateau corresponding to one polarity of the signal to a plateau corresponding to the other polarity. At the hearing, Defendants represented their focus is on the other two issues. Further, both parties are arguing the “real world” or “random” fluctuations such as those shown in SynQor’s figure above are not what is meant by “transition.” However, each party asserts the other party’s construction would encompass such fluctuations. As the parties are in agreement as to the basic concept and neither party appears to have asserted a conflicting understanding of “transition,” there appears to be no need to disturb the construction of the ‘497 Order in this regard, a construction that in an ordinary reading to one skilled in the art (and to a jury in context of the art) would be clear.³

“full resonant, quasi-resonant and multi-resonant converters”

Defendants rely primarily on the prosecution history statements quoted above. The prosecution history must show that the patentee clearly and unambiguously disclaimed or disavowed the proposed interpretation during prosecution to obtain claim allowance. *Middleton Inc. v. 3M Co.*, 311 F.3d 1384, 1388 (Fed. Cir. 2002). Statements will constitute disclaimer of scope only if they are “clear and unmistakable statements of disavowal.” *See Cordis Corp. v.*

³ If the parties’ positions subsequently change to include such random, real-world, or noise fluctuations within the meaning of the term and this issue becomes an *O2 Micro* problem at a later date, at that time the parties may seek a clarification from the Court on the construction.

Medtronic Ave, Inc., 339 F.3d 1352, 1358 (Fed. Cir. 2003). An “ambiguous disavowal” will not suffice. *Schindler Elevator Corp. v. Otis Elevator Co.*, 593 F.3d 1275, 1285 (Fed. Cir. 2010) (citation omitted). Because the file history “represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful in claim construction proceedings.” *Phillips*, 415 F.3d at 1317. When read in full context, and in context of the specification passage at ‘190 8:11-19, a clear disclaimer as to resonant converters is not created. Rather, the passages together are indicative that converters which fail the 20% limitation are what was being excluded. The passages are not clear that all resonant converters are disavowed. In context, the more natural reading of the prosecution history and the specification is that the 20% limitation was the point of distinction relied upon.

The Court construes “**transition times**” to mean “**time periods during which a change of a voltage waveform occurs across a primary winding.**” The Court construes “**transition times which are short relative to the on-state and off-state times of the controlled rectifiers**” to mean “**the sum of all transition times totals less than 20% of the overall on-state and off-state times of the controlled rectifiers.**”

C. “Substantially Uninterrupted Flow of Power”

“substantially uninterrupted flow of power through the primary and secondary winding circuits” (‘021 Patent claims 1, 31, 47)	
Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“throughout at least the portions of the switching cycle other than the brief transition times, power flows through the primary and secondary winding circuits”	“throughout the switching cycle, power flows through the primary and secondary winding circuits without substantial interruption”

“power flow through the ...converter is substantially uninterrupted” (‘702 Patent claims 19, 46, 75)	
Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“throughout at least the portions of the switching cycle other than the brief transition times, power is flowing through the converter.”	“throughout the switching cycle, power is flowing through the converter without substantial interruption”

These terms were not addressed in the ‘497 Order.

(1) Parties’ Positions

The primary dispute relates to SynQor’s addition of “other than the brief transition times” to the construction. SynQor cites to the specification statement: “during normal operation the isolation stage is operated at a fixed duty cycle in which power is always flowing from input to output (except during the brief switch transitions).” (‘021 Patent at 4:8-11). SynQor asserts the specification contrasts this to non-normal operations in which the voltage across the transformer winding is zero (and thus power is also zero). (Docket Entry #277 at 20) (citing ‘021 4:4-5). SynQor similar notes the ‘190 Patent includes the statement that power flow through the isolation stage is “not interrupted (except to charge/discharge parasitic capacitances and inductances).” (‘190 Patent at 6:2-4). SynQor relies on its expert’s report, asserting charging and discharging of the parasitic capacitances and inductances occurs during the transition time. (Docket Entry #277 at 20).

In their response, Defendants assert the parties’ constructions are close, with the significant difference being “other than the brief transition times.” (Docket Entry #280 at 12). Defendants assert SynQor’s construction is likely to confuse the jury. Specifically, Defendants assert SynQor’s construction provides no guidance as to what is “brief.” Defendants assert SynQor’s expert testified there was nothing in the ‘021 claim 1 that limits the length of

transitions. (*Id.*). Thus, Defendants assert SynQor's construction would encompass, for example, transitions lasting 95% of the switching cycle. According to Defendants, it would be absurd to find that "substantially uninterrupted power flow" would encompass a system having no power flow 95% of the time. (*Id.* at 12-13). Defendants further assert the '021 4:8-11 passage cited by SynQor does not teach *per se* that power flow interrupted only during a "brief switch transition" is substantially uninterrupted. (*Id.* at 13). Defendants assert this passage merely describes when an interruption can occur in a particular embodiment. (*Id.* at 13).

In reply, SynQor asserts Defendants' proposed construction merely reorders the terms to be construed and provides no guidance as to the meaning of "substantial." (Docket Entry #285 at 8). SynQor reiterates that '021 4:8-14 makes clear that power is always flowing "except during brief switch transitions." SynQor further asserts Defendants' construction does not make clear that power can be interrupted during switch transitions. (*Id.*). SynQor expresses concerns that Defendants will assert that "brief" switch transitions are substantial interruptions. SynQor asserts the parties' agreement as to "short" transition times provides the guidance that Defendants assert is missing with regard to "brief." Finally, SynQor notes that "short transition times" was agreed to mean less than 20% of the switching cycle. (*Id.* at 8-9).

(2) Court's Construction

The specification describes that in normal operations "power is always flowing from input to output (except during the brief switch transitions)." ('021 Patent at 4:8-11). This concept conforms to the claim concept which states, for example in '021 Patent claim 1, "substantially uninterrupted flow of power through the primary and secondary winding circuits during normal operation." SynQor's proposal equates "brief" from the specification with the agreed 20% time limitation of the "short transition time" term. However, at the hearing,

Defendants objected, asserting the 20% limitation relates to the transformer voltage transition times and not to the switch transition times. Defendants are correct. At the hearing, the parties acknowledged that as the transformer voltage changes from high to low, at least some power flow still generally exists during at least some of such period. Moreover, the parties acknowledged that the power interruption occurs when the controlled rectifier switches are transitioning. This switch transitioning is the “brief switch transition” referenced in the specification. As noted with regard to the now agreed “controlled rectifier terms,” the switch transition occurs “at some point in the course of the change of the voltage waveform across a primary winding.”

Thus, the 20% time limitation of the transformer voltage change is not the proper context. Rather, the brief transistor switching times are the appropriate context for the period of power interruption. As the parties agreed at the hearing that the switch transition times provide context for the power interruption, there no longer appears to be a dispute as to whether the specification provides guidance as to the scope of “substantial.” Further, the parties did not articulate that a dispute remains that would be presented to the jury.⁴ Considering Defendants’ construction generally rewards the claims and in light of the acknowledgements of the parties, the Court finds these terms need no construction at this time. In context of the specification, the original claim language appears sufficiently clear and understandable for presentation to a jury.

The Court finds that the “**substantially uninterrupted flow of power**” terms have their plain and ordinary meaning.

⁴ As stated in footnote 3, if the parties’ positions subsequently change such that this issue becomes an *O2 Micro* problem at a later date, at that time the parties may seek a clarification from the Court on the construction.

D. “Power Flow “First Before” Any Regulation Stage

<p>“a non-regulating isolating step-down converter through which power from the DC input flows first before flowing through any regulation stage” (‘702 Patent claims 1, 28, 55)</p>	
Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
<p>“step-down converter” has the same meaning as down converter.” “Down converter” means “a switching regulator where power flows toward the lower voltage.” See constructions for “nonregulating,” “isolating,” and “regulation.” SynQor is of the view that no further construction of this phrase is required.</p>	
<p>“flowing power from the DC input through a non-regulating isolating step-down converter first before any regulation stage” (‘702 Patent claims 78, 82, 86)</p>	
Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
<p>“step-down converter” has the same meaning as down converter.” See constructions for “down converter,” “nonregulating,” “isolating,” and “regulation.” SynQor is of the view that no further construction of this phrase is required.</p>	

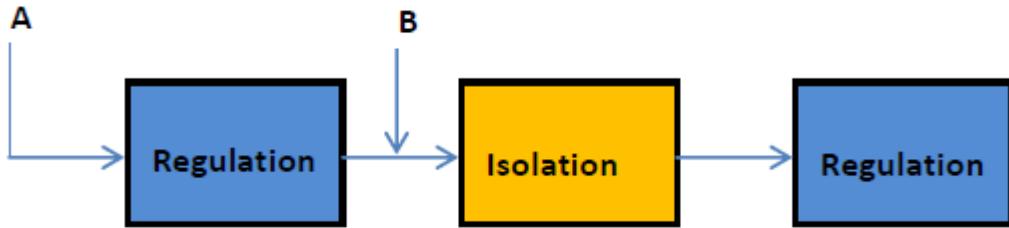
These disputed terms were not addressed in the ‘497 Order.

(1) Parties’ Positions

The primary issue in dispute is whether the terms require the signal to be powered from an unregulated DC input voltage. SynQor asserts the parties appear to agree as to the meanings of “step-down converter,” “down converter,” “isolating” and “regulation.” SynQor asserts the remaining language which states that power “flows first before flowing through any regulation stage” merely means what it says – that power from the DC input flows through the non-regulating isolating converter before it flows through a regulation stage. (Docket Entry #277 at 25). SynQor asserts Defendants’ construction adds “powered from” an unregulated DC input

voltage. SynQor contends the claim language is a temporal limitation which deals with the order of power flow, and Defendants' construction deals with the type of signal that is powering the converter (an unregulated DC input voltage). (*Id.*).

In their response, Defendants assert the plain language of the claim requires that power flow on a path from a "DC input" to an isolating converter that does not include a regulation stage. According to Defendants, the plain language is ambiguous and gives no guidance as to how to identify the relevant path from which a regulation stage must be absent. (Docket Entry #280 at 24). Defendants use a figure to illustrate the problem:



(*Id.* at 25). Defendants contend that under SynQor's construction, the inquiry depends totally on an identification of some point in the circuit as being the DC input. If point A is the input, then the claim limitation is not met (because power first flows through the regulator). But if point B is considered to be the DC input then the claim limitation is met. (*Id.*). Defendants assert their construction requires the DC input to be an unregulated input and resolves this ambiguity. *Id.* Defendants point out this conforms to the plain meaning of the claims in which the "power from the DC input flows first before flowing through any regulation stage." Defendants assert their construction eliminates the need for the jury to identify an arbitrary DC input. Finally, Defendants assert their construction also conforms to the specification which only teaches unregulated inputs. ('190 Patent at 4:23-25) (citing to input voltage variations).

In its reply, SynQor reiterates there is no ambiguity. SynQor asserts the first element of the claim ('702 Patent claim 1) describes the DC input, and there is no need to add a different more restrictive DC input limitation.

(2) Court's Construction

At the hearing, SynQor acknowledged that the claimed system provides a DC-DC power converter system that has a DC input provided to a non-regulating isolation converter prior to any regulation stages in the system. (Hearing Slides 3 and 6). SynQor asserts the claims provide the description of any required characteristics of the system DC input, for example '702 Patent claim 1: "a DC input providing an input voltage that varies over a range that is more than plus or minus a few percent." SynQor expressed concern that Defendants would utilize their construction to confuse the jury by pointing to some regulation stage that is not part of the DC-DC power converter system.

On its face, the claim language is clear. The claims describe the characteristics of the DC input and the configuration of the isolating converter with regard to any regulation stage in the system. SynQor is correct that Defendants' construction could lead to jury confusion as to elements outside of the claimed system.

The Court therefore construes "**“a non-regulating isolating step-down converter through which power from the DC input flows first before flowing through any regulation stage”** and "**“flowing power from the DC input through a non-regulating isolating step-down converter first before any regulation stage”** to have their plain and ordinary meaning.

E. “Control Circuit Which Controls Duty Cycle” terms

“control circuit which controls duty cycle of the primary winding circuit” (‘021 Patent claim 1)	
“controlling duty cycle of the power to the primary winding” (‘021 Patent claim 31)	
Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“primary winding circuit” has the same meaning as “primary transformer winding circuit.” “Primary transformer winding circuit” means “a circuit that includes a primary winding of a transformer.” SynQor is of the view that no further construction of this phrase is required.	“a control circuit that maintains the duty cycle of the primary winding circuit” Defendants alternatively propose: “a control circuit which controls the duty cycle of the primary winding circuit so as to maintain the duty cycle during normal operation.”

The ‘497 Order provided no further construction beyond the agreed construction of “primary winding circuit.” However, neither party in that case argued for a construction of “control circuit.”

(1) Parties’ Positions

The primary dispute involves whether a circuit that “controls the duty cycle” is a circuit that “maintains” the duty cycle. In its opening brief, SynQor notes the parties agree to the meaning of the terms “primary winding circuit” and “primary transformer winding circuit.” (Docket Entry #277 at 26) (citing Dkt. 267 at 49). SynQor asserts the ‘497 court did not need to construe “control circuit.” (*Id.*). SynQor objects to Defendants’ proposal, asserting it redefines “control” to mean “maintains.” SynQor asserts these two terms carry different meanings as “maintain” relates to keeping in a particular state whereas “control” is related to restraining or directing influence over. (*Id.*). SynQor asserts a circuit may control the duty cycle by changing it

from one value to another in which case the circuit is not “maintaining” the duty cycle. (*Id.*). SynQor also asserts the specification refers to “variable duty cycle control” which indicates that “control” may include varying the duty cycle and is not limited to situations in which the duty cycle is maintained. (*Id.*) (citing ‘021 3:52-56, 3:62-65). SynQor further cites to the usage in the specification of a “PWM control chip” that can “reduce its duty cycle.” (*Id.*) (citing ‘021 Patent at 4:60-63).

In their response, Defendants cite to ‘021 4:8-10, 4:54-58 as describing the pulse width modulator (“PWM”) control chip of the “control circuit” as being “normally operated such that the gate drive signals ... give the fixed duty cycle operation.” (Docket Entry #280 at 27). Defendants assert the specification contrasts the normal operation in which the duty cycle is fixed with “other than normal operations” in which the duty cycle may be reduced. (*Id.*) (citing ‘021 Patent at 2:19-22). Defendants assert the claims draw the same distinction as ‘021 claims 1, 31, and 47 describe controlling in normal operations and dependent claims 2, 17, 20 and 32 relate to reducing the duty cycle in periods other than normal operation. Defendants also cite to independent claim 47 which includes “means for controlling the duty cycle in normal operation” and dependent claim 48 which adds “means for reducing the duty cycle...in other than normal operation.” Defendants argue this distinction supports construing “controlling” as “maintaining.”

In its reply, SynQor states the specification nowhere defines “control” to mean “maintain.” SynQor asserts there is no requirement in the specification to read into the term a specific implementation from the preferred embodiment. (Docket Entry #285 at 10). Regarding Defendants’ claim differentiation argument, SynQor asserts claim 48 (which requires the duty cycle be reduced in other than normal operation) is different from and narrower than merely

general “controlling” and thus the doctrine does not require “controlling,” in claim 47 to mean “maintaining.” (*Id.*)

(2) Court’s Construction

Defendants do not rebut the concept that the ordinary meanings of “controlling” and “maintaining” are not the same. Rather, Defendants merely point to an embodiment in the specification in which the control is a type that maintains the duty cycle. However, Defendants do not point to any clear disavowal in the specification mandating this embodiment of “control” to be incorporated into the claims. *See Arlington Industries, Inc.*, 632 F.3d at 1254 (“Even where a patent describes only a single embodiment, claims will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.”) (internal citations omitted). Further, SynQor has pointed to usages in the specification in which “control” is used in the context of controlling the duty cycle in variable manner, not just “maintaining.” (‘021 Patent at 3:52-56, 3:62-65, 4:60-63). Usage of control circuits in this manner makes clear that as used in the ‘021 Patent “control” does not equate to “maintain.” In addition, “[a] claim interpretation that excludes a preferred embodiment from the scope of the claim ‘is rarely, if ever, correct.’” *Globetrotter Software, Inc. v. Elam Computer Group Inc.*, 362 F.3d 1367, 1381 (Fed. Cir. 2004) (quoting *Vitronics Corp.*, 90 F.3d at 1583).

As for the claim differentiation argument, SynQor properly notes that even if “control” is given its broader more general meaning, dependent claim 48 adds a narrower structure in which the claim further adds a particular type of control means to “reduce the duty cycle of the primary winding circuit to cause freewheeling period in the other than normal operation.” Thus, claim differentiation does not support requiring “controlling” to mean “maintaining.” The Court finds

“control circuit which controls duty cycle of the primary winding circuit” and “controlling duty cycle of the power to the primary winding” need no further construction other than the agreed primary winding limitations.

F. Means for Controlling Duty Cycle

“means for controlling duty cycle of the power to the primary winding, the duty cycle causing substantially uninterrupted flow of power through the primary and secondary windings during normal operation to provide an isolated output without regulation” (‘021 Patent claim 47)	
Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Agreed Claimed Function: “controlling the duty cycle of the power to the primary winding such that the duty cycle causes substantially uninterrupted flow of power through the primary and secondary windings during normal operation to provide an isolated output without regulation” Claimed Structure: “Figures 4A, 4B, 4C, and 4D of the ‘021 patent, column 4, line 32 through column 5, line 5 of the ‘021 patent, and equivalents thereof.”	Agreed Claimed Function: “controlling the duty cycle of the power to the primary winding such that the duty cycle causes substantially uninterrupted flow of power through the primary and secondary windings during normal operation to provide an isolated output without regulation” Claimed Structure: Indefinite

The ‘497 Order adopts a construction of the claimed structure that matches SynQor’s proposed construction. (‘497 Order at 37-40).

(1) Parties’ Positions

Defendants assert there is no structure corresponding to the claimed function. SynQor asserts the ‘497 court rejected the argument that the term was indefinite for lack of a disclosed structure corresponding to the function. SynQor notes the ‘497 Order found that the ‘021 Patent “expressly provides that a ‘control circuit’ performs the claimed function” and that “Figures 4A-4D show a control circuit for the circuits embodying the present invention.” (Docket Entry #277

at 27-28) (quoting ‘497 Order at 39). SynQor further quotes the ‘497 Order as stating that “it is clear that the disclosed ‘control circuit’ is clearly linked to and associated with the claimed function.” (*Id.* at 28) (quoting ‘497 Order at 40).

In their response, Defendants contend there is no disclosure of (1) structure capable of controlling the duty cycle of the power to the primary winding and (2) structure that causes substantially uninterrupted flow of power during normal operation to provide an isolated output without regulation. (Docket Entry #280 at 28). They argue the specification at 4:32-5:5 covers a range of topics but fails to clearly identify a structure that corresponds with the claimed function. (*Id.* at 29). Defendants assert the most pertinent language merely references a class of control chips that when normally operated facilitate a fixed duty cycle. (*Id.*) (citing ‘021 4:54-58) They contend the cited passage fails to reference components that both control the duty cycle and create a substantially uninterrupted flow of power during normal operation. (*Id.* at 29-30).

In reply, SynQor asserts Defendants admit that the U100 pulse width modulator control chip (the referenced class of control chips) facilitate a fixed duty cycle, and Defendants have not pointed to clear and convincing evidence that the claim is invalid. (Docket Entry #285 at 10).

(2) Court’s Construction

The arguments raised are substantially the same as those asserted in the ‘497 Case. *See* ‘497 Order at 39-40. Prior claim construction proceedings involving the same asserted patents are “entitled to reasoned deference under the broad principals of stare decisis and the goals articulated by the Supreme Court in *Markman*, even though stare decisis may not be applicable *per se.*” *Maurice Mitchell Innovations, LP v. Intel Corp.*, No. 2:04-CV-450, 2006 WL 1751779, at *4 (E.D. Tex. June 21, 2006). The Court nonetheless conducts an independent evaluation during claim construction proceedings. *See, e.g., Texas Instruments, Inc. v. Linear Techs. Corp.*,

182 F. Supp. 2d 580, 589-90 (E.D. Tex. 2002); *Burns, Morris & Stewart Ltd. P'ship v. Masonite Int'l Corp.*, 401 F. Supp. 2d 692, 697 (E.D. Tex. 2005); *Negotiated Data Solutions, Inc. v. Apple, Inc.*, No. 2:11-CV-390, 2012 WL 6494240 (E.D. Tex. Dec. 13, 2012).

The specification states that “a control circuit controls duty cycle of the primary winding circuit, the duty cycle causing substantially uninterrupted control of power through the primary and secondary winding circuits during normal operation.” (‘021 Patent at 2:14-18). Further, the specification describes FIGS. 4A-4C as showing “a control circuit for the circuits of FIGS. 1-3 and embodying the present invention, and FIG. 4D shows an alternative to the circuit of FIG. 4B. (‘021 Patent at 63-65).” The circuits are described in more detail at 4:32-5:5. Thus, the ‘021 Patent discloses the structure shown in FIGS. 4A-4D and the corresponding specification description as performing the claimed controlling function. As noted in the ‘497 Order, “[w]hile the actual operation of the disclosed control circuits may be less than clear to the Court, it is clear that the disclosed ‘control circuit’ is clearly linked to and associated with the claimed function. (See ‘021 Patent at 2:13-18). Thus the Court finds that the claim is not invalid.” (‘497 Order at 40). In light of the disclosure in the specification, the construction of the ‘497 Order does not require modification.

IV. CONCLUSION

The Court hereby orders the claim terms addressed herein construed as indicated. A chart summarizing these constructions is attached as Exhibit A.

The parties are further ordered that they may not refer, directly or indirectly, to each other’s claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual constructions

adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the constructions adopted by the Court.

SIGNED this 2nd day of January, 2014.



CAROLINE M. CRAVEN
UNITED STATES MAGISTRATE JUDGE

Exhibit A

Agreed Claim Term	Agreed Construction or Structure
"connected" '190: 1, 12, 20, 27, 30, 33	"Electrically connected, directly or indirectly."
"isolation" '190: 1, 9, 13, 20, 23, 25, 27, 30, 33 '034: 1, 8, 16, 20, 21, 24 '021: 1, 22, 24, 31, 47 '290: 4	"The absence of an electric path permitting the flow of DC current (other than a de minimus amount) between an input and an output of a particular stage, component, or circuit."
"isolating" '083: 1, 2, 14, 15, 39 '702: 1, 18, 19, 23, 26, 27, 28, 45, 46, 50, 53, 54, 55, 64, 67, 68, 74, 75, 78, 81, 82, 85, 86, 89 '290: 1, 6, 9, 10, 11, 14, 15	"The absence of an electric path permitting the flow of DC current (other than a de minimus amount) between an input and an output of a particular stage, component, or circuit."
"isolated" '190: 30, 32, 33 '034: 20, 28 '021: 31, 45, 47 '083: 1, 2, 14, 20, 39 '702: 1, 17, 18, 23, 26, 27, 28, 44, 45, 50, 53, 54, 55, 64, 67, 68, 73, 74, 78, 81, 82, 85, 86, 89 '290: 6, 9, 10, 11, 14, 15	"The absence of an electric path permitting the flow of DC current (other than a de minimus amount) between an input and an output of a particular stage, component, or circuit."
"regulated output" '190: 30, 33 '034: 20, 28 '021: 31, 47 '702: 28, 82	"An output that is controlled towards a predefined value."
"regulated DC output" '702: 1, 28, 55, 78, 82, 86 '290: 1, 7	"A DC output that is controlled towards a predefined value."
"regulating" '190: 1, 20, 27 '021: 1	"Controlling an output towards a predefined value."
"regulation"	"The act of controlling an output towards a predefined

<p>'190: 1, 2, 3, 10, 14, 15, 16, 19, 20, 21, 26, 27, 30 '034: 8, 20, 24, 28 '021: 1, 21, 23, 25, 26, 27, 30, 31, 47 '702: 1, 28, 55, 78, 82, 86</p>	value."
<p>"non-regulating" '190: 1, 20, 29 '021: 1 '083: 1, 14, 15, 39 '702: 1, 18, 19, 23, 26, 28, 45, 46, 50, 53, 55, 64, 67, 74, 75, 78, 81, 82, 85, 86, 89 '290: 1, 4, 6, 9, 11</p>	"Not controlling an output towards a predefined value."
<p>"without regulation" '190: 30 '021: 31, 47</p>	"The act of not controlling an output towards a predefined value."
<p>"normally non-regulating" '021: 1</p>	"Non-regulating during normal operation."
<p>"during normal operation" '021: 1, 31, 47</p>	"During a normal mode of operation that excludes start-up, shutdown, and fault conditions such as overcurrent conditions."
<p>"semi-regulated, isolated output" '034: 20, 28</p>	"An isolated output that is controlled towards a predefined value by sensing a voltage in the primary transformer winding circuit without sensing the isolated output voltage."
<p>"semi-regulation" '034: 1, 16, 21</p>	"The act of controlling an output towards a predefined value by sensing a voltage in the primary transformer winding circuit without sensing the isolated output voltage."
<p>"nearly losslessly delivered to and recovered from capacitors associated with the controlled rectifiers" '190: 11 '083: 16 '702: 20, 47, 76</p>	"No more than 30% of the energy delivered to and recovered from capacitors associated with the controlled rectifiers is dissipated."
<p>"down converter"</p>	"A converter where the output voltage is lower than

<p>'190: 3, 21 '021: 21 '702: 1, 23, 26, 28, 50, 53, 55, 64, 67, 78, 81, 82, 85, 86, 89 '290: 2</p>	<p>the input voltage."</p>
<p>"control circuit that senses a voltage in the primary transformer winding circuit to provide a feedback control signal without bridging an isolation barrier between the primary and secondary transformer winding circuits"</p> <p>'034: 1</p>	<p>"Senses a voltage in the primary transformer winding circuit to provide a feedback control signal without bridging an isolation barrier between the primary and secondary transformer winding circuits" means "senses a voltage in the primary transformer winding circuit to provide a feedback signal that is used to control the duty cycle of a transistor in the primary transformer winding circuit without passing the feedback signal across the isolation barrier of the primary and secondary transformer winding circuits." No further construction of this phrase is required.</p>
<p>"multiple non-regulating isolating step down converters providing plural nonregulated, isolated DC outputs, plural of the non-isolating down converter switching regulators receiving power from one of the non-regulated, isolated DC outputs"</p> <p>'702: 23, 26, 50, 53, 64, 67, 81, 85, 89</p>	<p>"Two or more non-regulating isolating step down converters, each providing a non-regulated, isolated DC output, wherein two or more of the non-isolating down-converter switching regulators receives power from one of the non-regulated, isolated DC outputs."</p>
<p>"transformer that is not driven into saturation"</p> <p>'702: 1, 82, 86</p>	<p>"Transformer that is connected in a manner such that the transformer's magnetic flux density level is less than its saturation flux density level."</p>
<p>"means for providing plural regulated outputs, without further isolation, from the isolated output"</p>	<p><u>Claimed Function:</u> "Providing plural regulated</p>

'021:47	outputs, without further isolation, from the isolated output."
<p>"a non-regulated, isolated DC output"</p> <p>'083: 1, 14, 20, 39 '702: 1, 17, 18, 23, 26, 28, 44, 45, 50, 53, 55, 64, 67, 73, 74, 78, 81, 82, 85, 86, 89 '290: 1, 6, 9, 10, 11, 14, 15</p>	"An isolated DC output that is not controlled towards a predefined value." See construction of "isolated."
<p>"non-regulated output"</p> <p>'021: 1</p>	"An output that is not controlled towards a predefined value."
<p>"plural non-regulated, isolated DC outputs"</p> <p>'702: 26, 53, 67, 81, 85, 89</p>	"More than one isolated DC output that is not controlled towards a predefined value." See construction of "isolated."
<p>"a normally non-regulated output"</p> <p>'021: 1</p>	"Non-regulated output that occurs during normal operation." "Normal operation" means "a normal mode of operation that excludes start-up, shutdown, and fault conditions such as over-current conditions."
<p>"a non-regulated, isolated DC output having a non-regulated voltage"</p> <p>'702: 1, 28, 55, 78, 82, 86</p>	"A non-regulated, isolated DC output that has a voltage that is not controlled to a predefined value." See construction of "isolated."
<p>"an isolated output without regulation"</p> <p>'190: 30 '021: 47</p>	"Isolated output" means "an output that is isolated from the input." See constructions for "isolated" and "without regulation."
<p>"an isolated output normally without regulation"</p> <p>'021: 31</p>	See constructions for "isolated output" and "normally without regulation."

<p>“each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding”</p> <p>‘190: 1, 20, 27, 30, 33 ‘083: 1, 39 ‘702: 1, 28, 55, 78, 82, 86 ‘290: 1</p>	<p>“each controlled rectifier being turned from on to off and from off to on at some point in the course of the change of the voltage waveform across a primary winding.”</p>
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Disputed Claim Term	Court’s Construction
<p>“fixed duty cycle”</p> <p>‘190: 1 ‘083: 1, 39 ‘702: 1, 28, 55, 78, 82, 86</p>	<p>“a duty cycle that is not varied to control the output voltage towards a predefined value.”</p>
<p>“transition times”</p> <p>‘190: 1, 28, 31 ‘702: 1, 28, 55, 78, 82, 86</p>	<p>“time periods during which a change of a voltage waveform occurs across a primary winding.”</p>
<p>“transition times which are short relative to the on-state and off-state times of the controlled rectifiers”</p> <p>‘190: 1, 28, 31 ‘702: 1, 28, 55, 78, 82, 86</p>	<p>“the sum of all transition times totals less than 20% of the overall on-state and off-state times of the controlled rectifiers.”</p>
<p>“substantially uninterrupted flow of power through the primary and secondary winding circuits”</p> <p>‘021: 1, 31, 47</p>	<p>Plain and ordinary meaning. No further construction necessary.</p>
<p>“power flow through the . . . converter is substantially uninterrupted”</p> <p>‘702: 19, 46, 75</p>	<p>Plain and ordinary meaning. No further construction necessary.</p>
<p>“a non-regulating isolating step-down converter through which power from the DC input flows first before flowing through any regulation stage”</p> <p>‘702: 1, 28, 55</p>	<p>Plain and ordinary meaning. No further construction necessary.</p>

<p>“flowing power from the DC input through a non-regulating isolating step-down converter first before any regulation stage”</p> <p>‘702: 78, 82, 86</p>	Plain and ordinary meaning. No further construction necessary.
<p>“control circuit which controls duty cycle of the primary winding circuit”</p> <p>‘021:1</p> <p>“controlling duty cycle of the power to the primary winding”</p> <p>‘021: 31</p>	No further construction required other than the agreed primary winding limitations.
<p>“means for controlling duty cycle of the power to the primary winding, the duty cycle causing substantially uninterrupted flow of power through the primary and secondary windings during normal operation to provide an isolated output without regulation”</p> <p>‘021: 47</p>	<p><u>Agreed Claimed Function:</u> “controlling the duty cycle of the power to the primary winding such that the duty cycle causes substantially uninterrupted flow of power through the primary and secondary windings during normal operation to provide an isolated output without regulation”</p> <p><u>Claimed Structure:</u> “Figures 4A, 4B, 4C, and 4D of the ‘021 patent, column 4, line 32 through column 5, line 5 of the ‘021 patent, and equivalents thereof.”</p>